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Streltsov et al.

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(54) **CURVING MECHANISM FOR A PORTABLE MOUSE**

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G06F 3/0354 (2013.01)

(52) **U.S. Cl.**
CPC ***G06F 3/03543*** (2013.01)

(58) **Field of Classification Search**
CPC G06F 3/03543
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,130,113	A *	12/1978	Graham	A61B 17/0293 600/224
6,970,156	B1 *	11/2005	Silverstein	G06F 3/03543 345/156
7,344,495	B2 *	3/2008	Ravikumar	A61B 17/02 600/219
8,619,032	B2 *	12/2013	Lee	G06F 3/03543 345/163
9,807,893	B2 *	10/2017	Li	G06F 1/1652
2006/0022943	A1 *	2/2006	Johnson	G06F 1/1616 345/157
2006/0176277	A1 *	8/2006	Daniel	G06F 3/0317 345/163
2010/0295786	A1 *	11/2010	Ai	G06F 3/03543 345/163
2012/0169600	A1 *	7/2012	Ma	G06F 3/03543 345/163
2012/0235911	A1 *	9/2012	Snyder	G06F 3/03541 345/163
2013/0027864	A1 *	1/2013	Wei	G06F 1/169 361/679.08
2014/0114138	A1 *	4/2014	Fedorov	A61B 17/0206 600/233
2015/0070278	A1 *	3/2015	Rehn	G06F 3/03543 345/163
2016/0364020	A1 *	12/2016	Deng	G06F 3/03543

* cited by examiner

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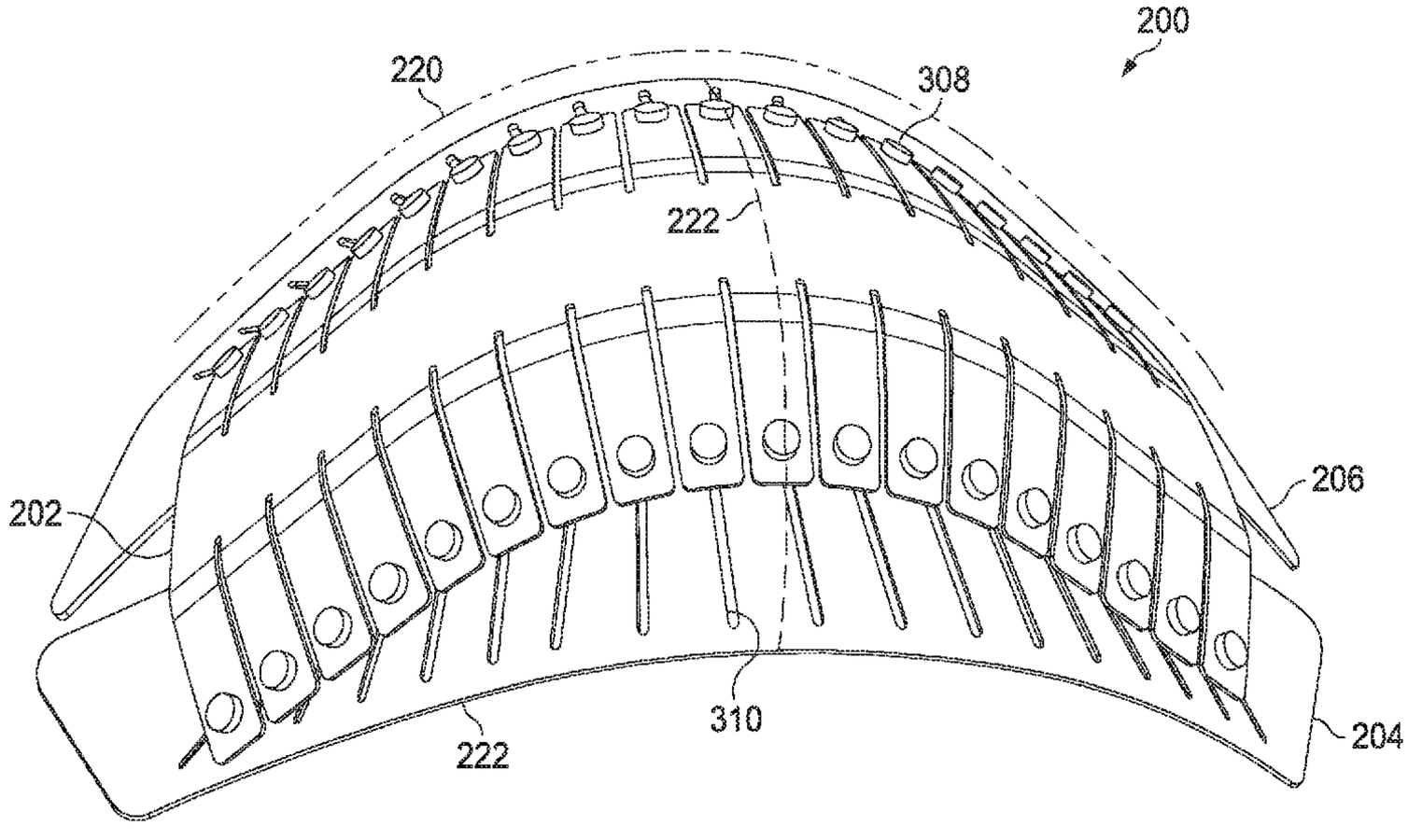
(57) **ABSTRACT**

Systems and methods are disclosed for coupling portions of portable mouse. A portable mouse includes a main plate. The portable mouse also includes a first side plate and a second side plate coupled to the main plate, wherein the main plate is configured to bend from a flat position to a curved position when the first and second side plates are pulled away from the main plate.

18 Claims, 5 Drawing Sheets



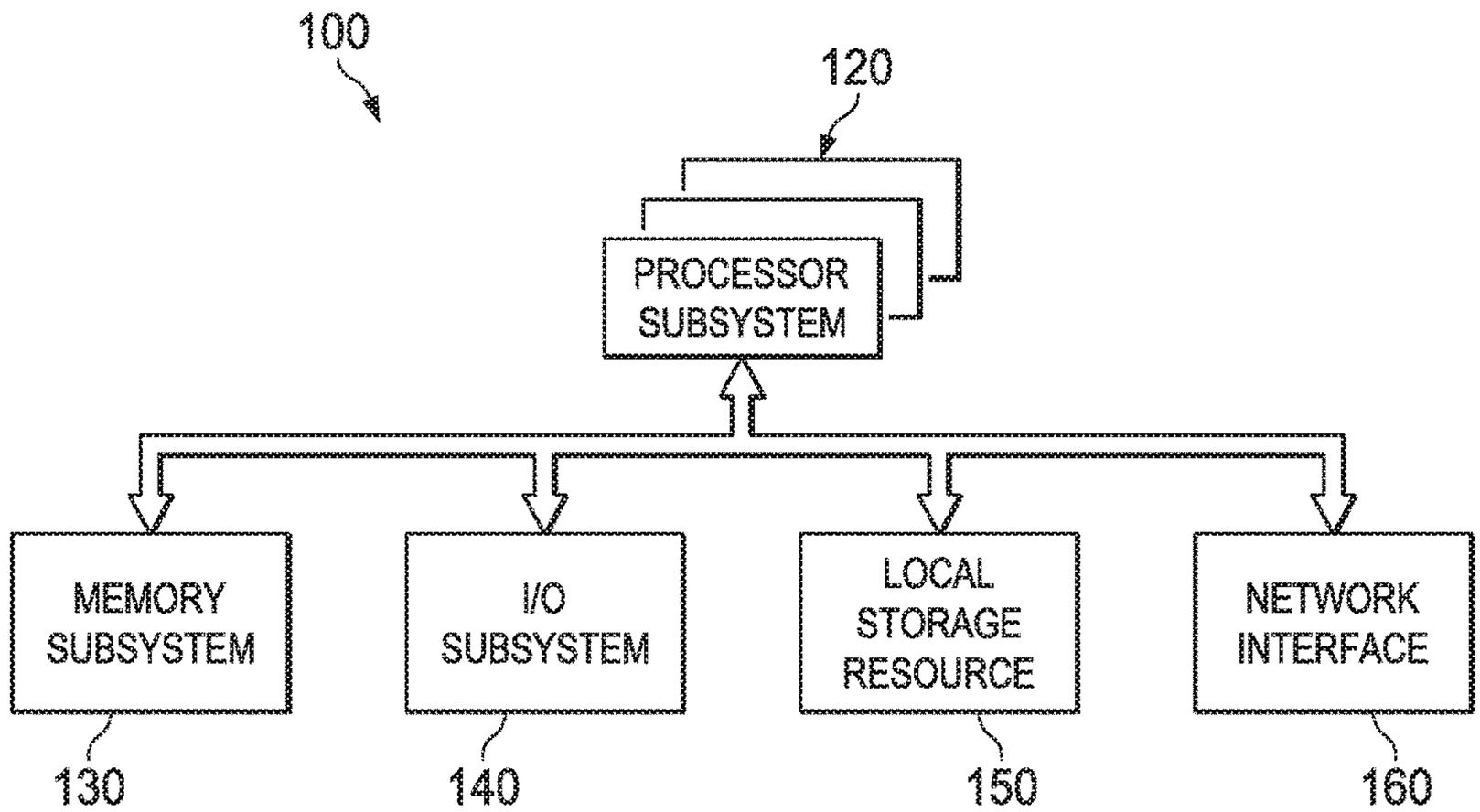

100
120
PROCESSOR SUBSYSTEM
MEMORY SUBSYSTEM
I/O SUBSYSTEM
LOCAL STORAGE RESOURCE
NETWORK INTERFACE
130
140
150
160

FIG. 1

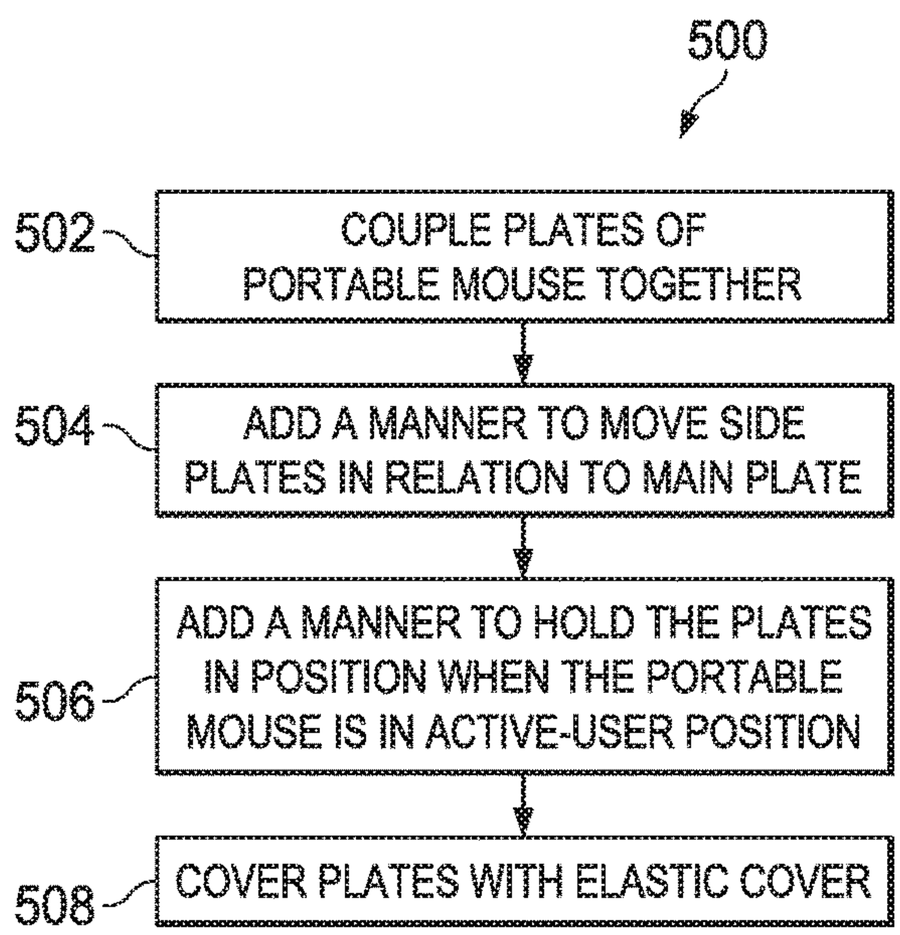

500
502
COUPLE PLATES OF PORTABLE MOUSE TOGETHER
504
ADD A MANNER TO MOVE SIDE PLATES IN RELATION TO MAIN PLATE
506
ADD A MANNER TO HOLD THE PLATES IN POSITION WHEN THE PORTABLE MOUSE IS IN ACTIVE-USER POSITION
508
COVER PLATES WITH ELASTIC COVER

FIG. 5

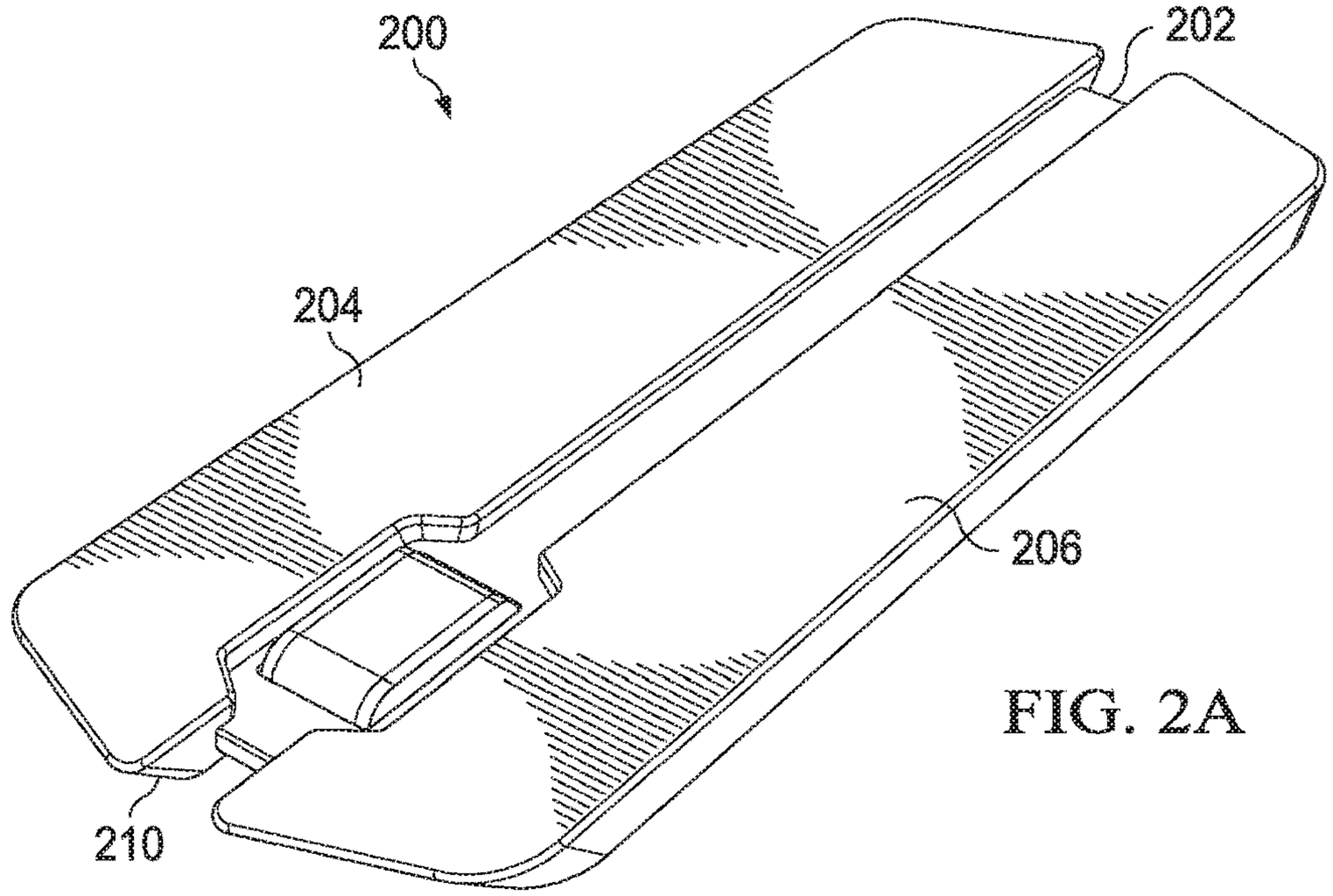


FIG. 2A

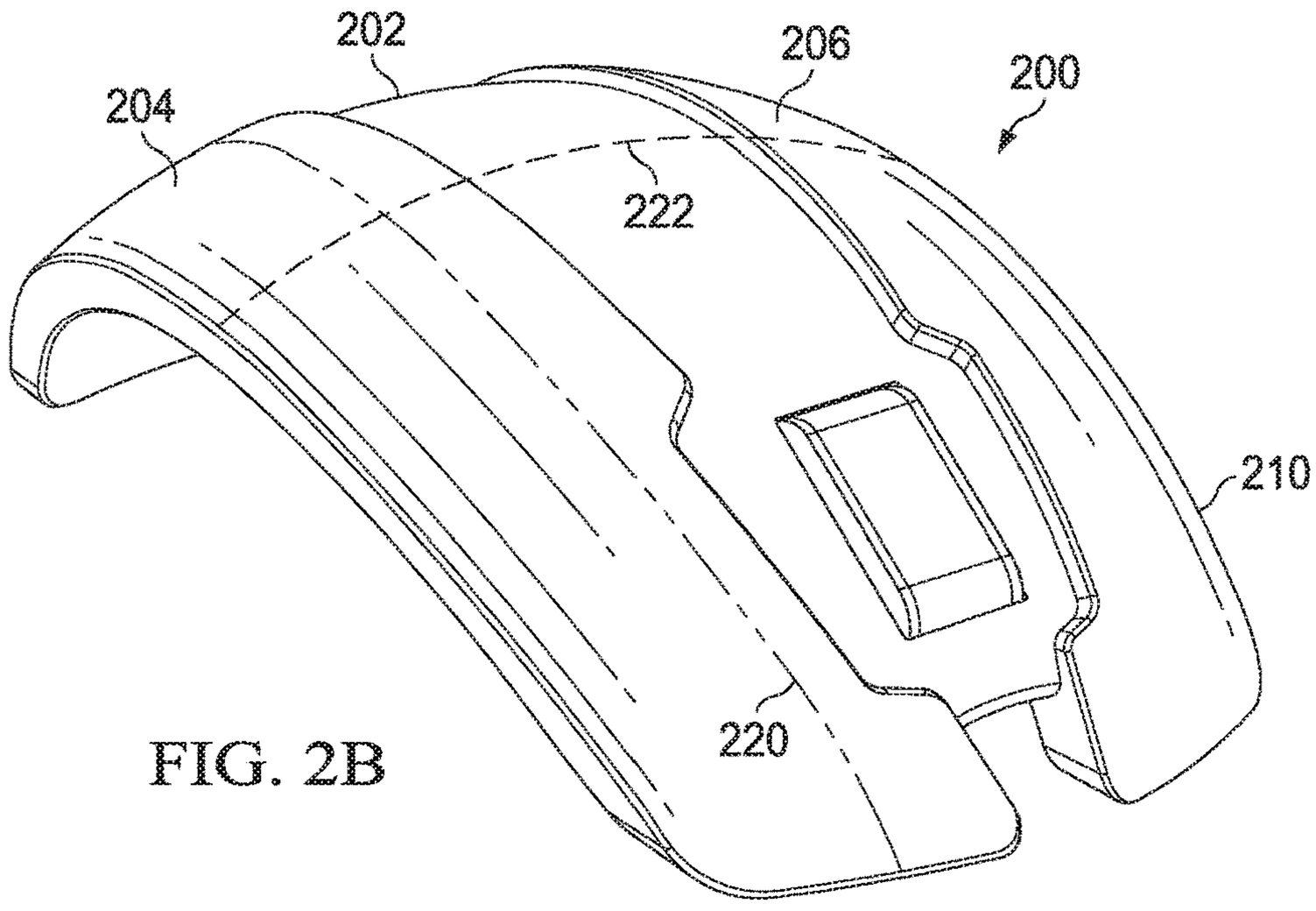


FIG. 2B

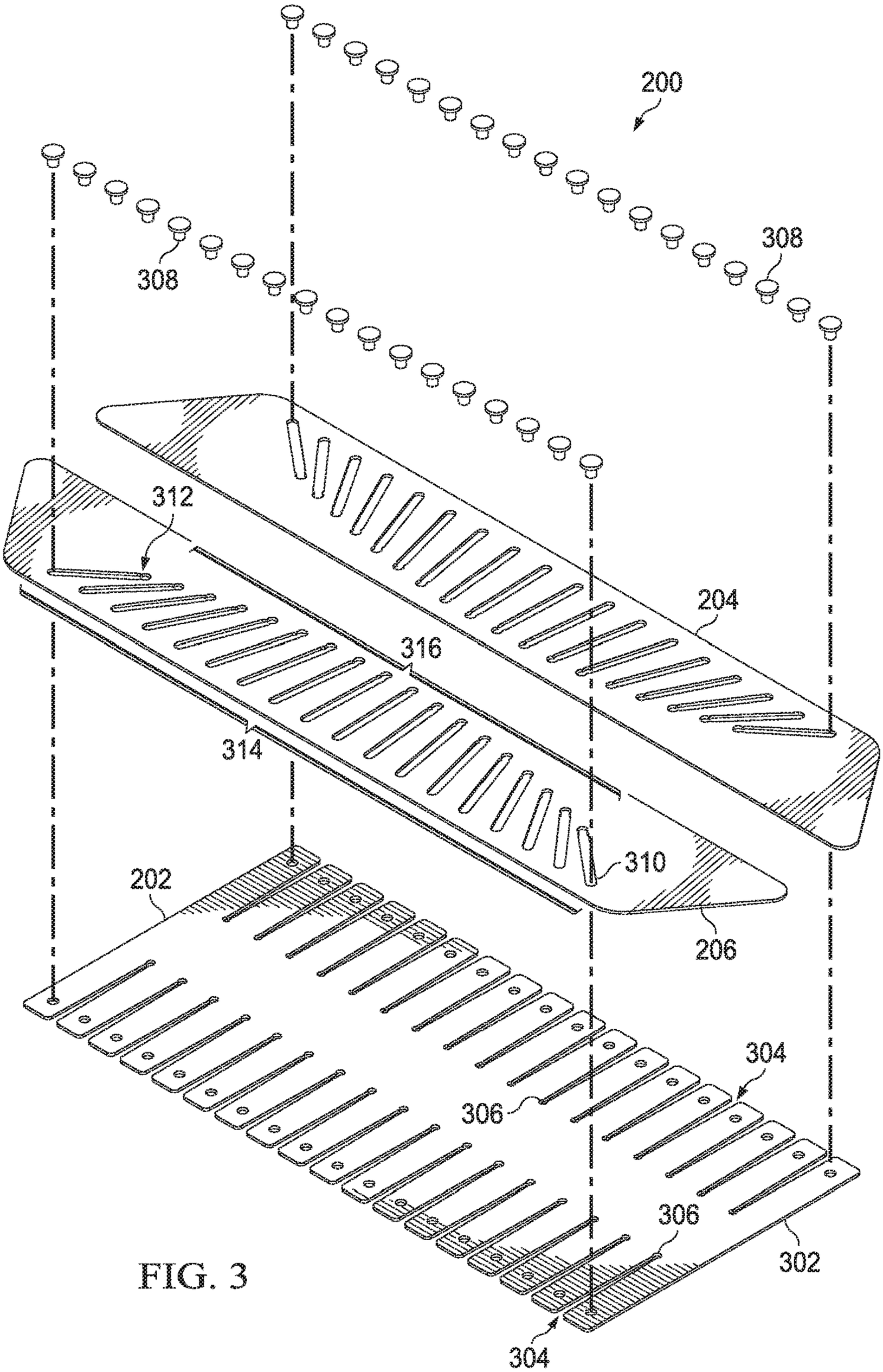


FIG. 3

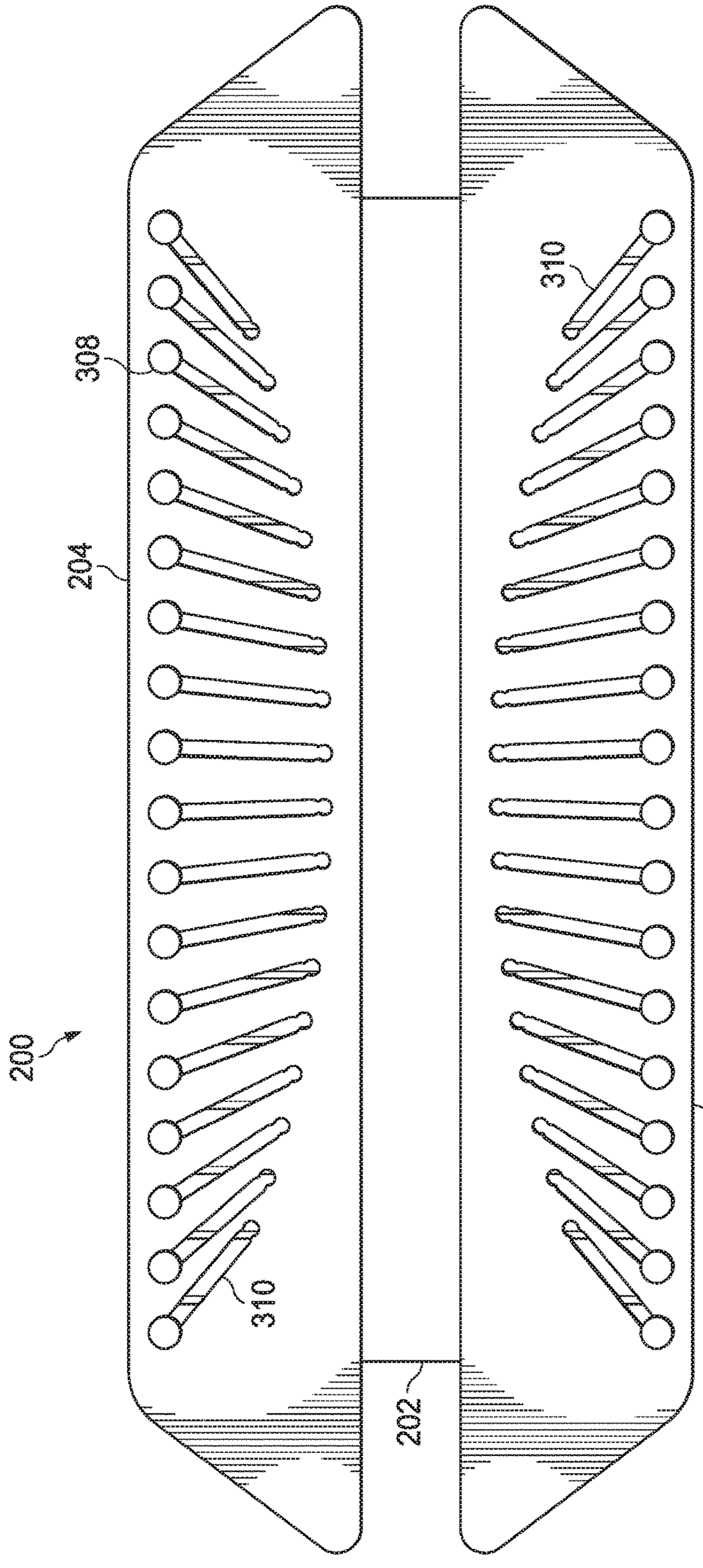


FIG. 4A

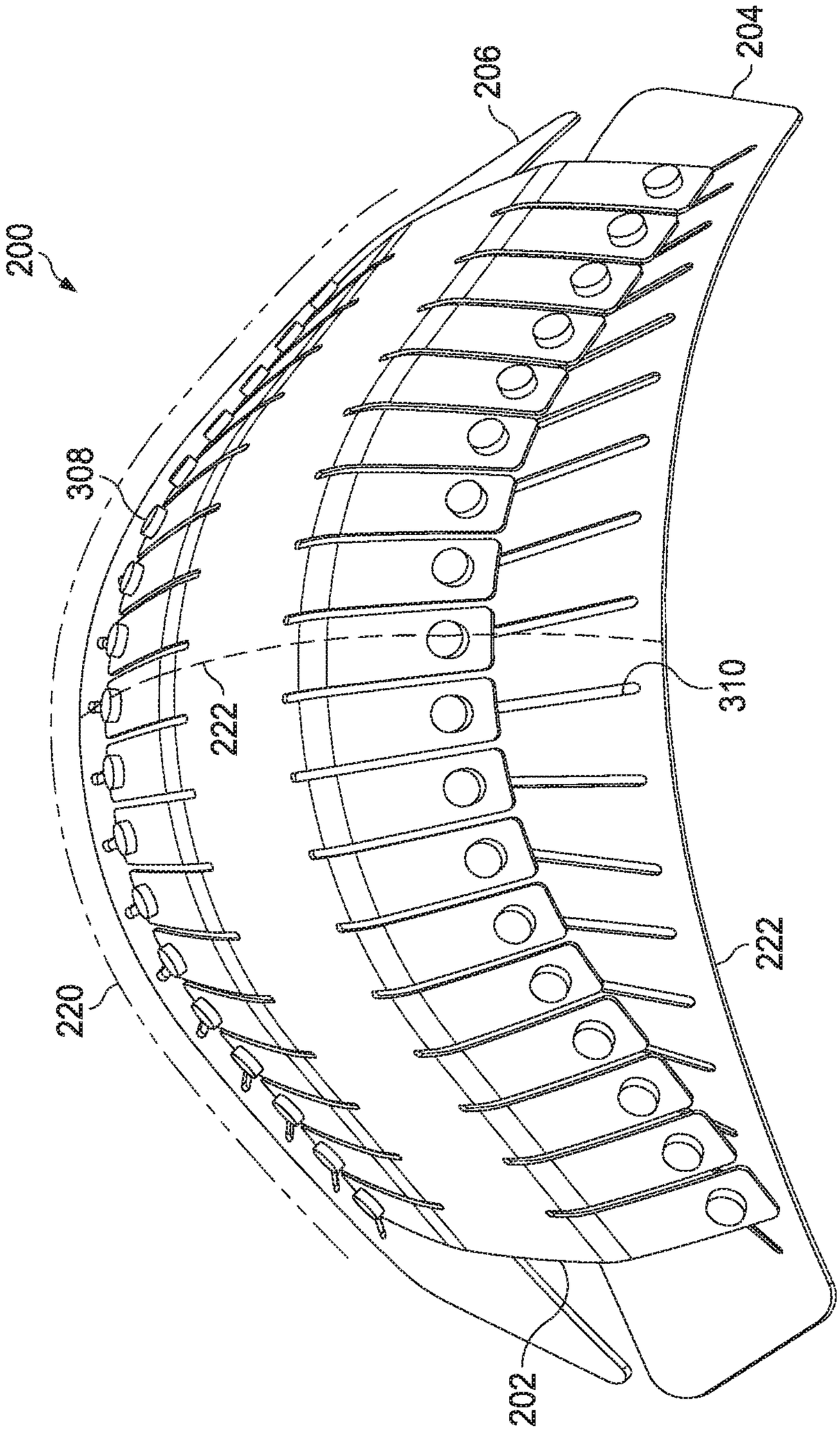


FIG. 4B

CURVING MECHANISM FOR A PORTABLE MOUSE

TECHNICAL FIELD

This disclosure relates generally to peripherals for information handling systems and, more particularly, to a curving portable mouse.

BACKGROUND

As the value and use of information continues to increase, individuals and businesses seek additional ways to process and store information. One option available to users is information handling systems. An information handling system generally processes, compiles, stores, and/or communicates information or data for business, personal, or other purposes thereby allowing users to take advantage of the value of the information. Because technology and information handling needs and requirements vary between different users or applications, information handling systems may also vary regarding what information is handled, how the information is handled, how much information is processed, stored, or communicated, and how quickly and efficiently the information may be processed, stored, or communicated. The variations in information handling systems allow for information handling systems to be general or configured for a specific user or specific use such as financial transaction processing, airline reservations, enterprise data storage, or global communications. In addition, information handling systems may include a variety of hardware and software components that may be configured to process, store, and communicate information and may include one or more computer systems, data storage systems, and networking systems.

Examples of information handling systems include portable information handling systems, such as, smart phones, tablet computers, notebook computers, media players, digital cameras, 2-in-1 tablet-laptop combination computers, wireless organizers, and/or combinations thereof. A portable information handling system may generally be any device that a user may carry for handheld use and that includes a processor.

Users of portable information handling systems seek peripheral devices to facilitate interaction and information input/output with the systems. Such peripheral devices should be portable so that they may be easily transported with the portable information handling system. However, users of portable peripheral devices often desire similar functionality and comfort offered by traditional peripheral devices. Thus, there is a need for functional and comfortable portable peripheral devices.

SUMMARY

In some embodiments, a portable mouse is disclosed that includes a main plate. The portable mouse also includes a first side plate and a second side plate coupled to the main plate, wherein the main plate is configured to bend from a flat position to a curved position when the first and second side plates are pulled away from the main plate.

In another embodiment, a method is disclosed that includes coupling a first side plate to a main plate. The method also includes coupling a second side plate to the main plate, wherein the main plate is configured to bend from a flat position to a curved position when the first and second side plates are pulled away from the main plate.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and its features and advantages, reference is now made to the following description, taken in conjunction with the accompanying drawings, in which:

FIG. **1** illustrates a block diagram of selected elements of an embodiment of a portable information handling system;

FIG. **2**A illustrates a perspective view of a portable mouse in flat space-saving position;

FIG. **2**B illustrates a perspective view of a portable mouse in curved active-usages position;

FIG. **3** illustrates a blown-up view of the mechanical elements of a curving portable mouse;

FIG. **4**A illustrates a bottom view of the mechanical elements of a curving portable mouse in space-saving position;

FIG. **4**B illustrates a perspective view of the mechanical elements of a curving portable mouse in active-usage position; and

FIG. **5** illustrates a flowchart depicting selected elements of an embodiment of a method for coupling portions of a portable mouse.

DETAILED DESCRIPTION

In the following description, details are set forth by way of example to facilitate discussion of the disclosed subject matter. It should be apparent to a person of ordinary skill in the field, however, that the disclosed embodiments are exemplary and not exhaustive of all possible embodiments.

As used herein, a hyphenated form of a reference numeral refers to a specific instance of an element and the unhyphenated form of the reference numeral refers to the collective or generic element. Thus, for example, widget "72-1" refers to an instance of a widget class, which may be referred to collectively as widgets "72" and any one of which may be referred to generically as a widget "72."

As noted previously, peripheral devices may help a user interact with a portable information handling system and/or facilitate the input and/or output of information to and from the system. A mouse is an exemplary peripheral device that assists a user with interacting with an information handling system. Movement of the mouse may move a pointer on the display of the information handling system, and clicking of a button may perform one or more additional operations on the information handling system. Although some portable information handling systems may include other means for interacting and communicating information to and from the system (e.g., a touch panel display or a trackpad), a user may nonetheless desire to use a peripheral portable mouse for convenience, functionality, familiarity, comfort, or other reasons.

In selecting a mouse, a user may desire a portable mouse that is easily transported with the portable information handling system. Similarly, a user may desire comparable comfort and functionality offered by a traditional mouse. As described in more detail below, a portable mouse may be designed to switch between a flat space-saving position and a curved active-usage position without sacrificing comfort or functionality.

For the purposes of this disclosure, an information handling system may include an instrumentality or an aggregate of instrumentalities operable to compute, classify, process,

transmit, receive, retrieve, originate, switch, store, display, manifest, detect, record, reproduce, handle, or utilize various forms of information, intelligence, or data for business, scientific, control, entertainment, or other purposes. For example, an information handling system may be a server, a personal computer, a PDA, a consumer electronic device, a network storage device, or another suitable device and may vary in size, shape, performance, functionality, and price. The information handling system may include memory, one or more processing resources such as a central processing unit (CPU) or hardware or software control logic. Additional components of the information handling system may include one or more storage devices, one or more communications ports for communicating with external devices as well as various input and output (I/O) devices, such as a keyboard, a mouse, and a video display. The information handling system may also include one or more buses operable to transmit communication between the various hardware components.

Particular embodiments are best understood by reference to FIGS. **1-5** wherein like numbers are used to indicate like and corresponding parts.

FIG. **1** illustrates a block diagram of selected elements of an embodiment of a portable information handling system **100** in accordance with some embodiments of the present disclosure. In various embodiments, portable information handling system **100** may represent different types of portable information handling systems, such as, smart phones, tablet computers, notebook computers, media players, digital cameras, 2-in-1 tablet-laptop combination computers, and wireless organizers. Components of portable information handling system **100** may include, but are not limited to, processor subsystem **120**, which may comprise one or more processors, and system bus **121** that communicatively couples various system components to processor subsystem **120** including, for example, memory subsystem **130**, I/O subsystem **140**, local storage resource **150**, and network interface **160**.

Processor subsystem **120** may comprise a system, device, or apparatus operable to interpret and/or execute program instructions and/or process data, and may include a microprocessor, microcontroller, digital signal processor (DSP), application specific integrated circuit (ASIC), or another digital or analog circuitry configured to interpret and/or execute program instructions and/or process data. In some embodiments, processor subsystem **120** may interpret and/or execute program instructions and/or process data stored locally (e.g., in memory subsystem **130**). In the same or alternative embodiments, processor subsystem **120** may interpret and/or execute program instructions and/or process data stored remotely (e.g., in a network storage resource, not shown).

System bus **121** may represent a variety of suitable types of bus structures, including for example, a memory bus, a peripheral bus, or a local bus using various bus architectures in selected embodiments. For example, such architectures may include, but are not limited to, Micro Channel Architecture (MCA) bus, Industry Standard Architecture (ISA) bus, Enhanced ISA (EISA) bus, PCI bus, PCI-E bus, HyperTransport (HT) bus, Integrated Interchip Sound (IIS) bus, Serial Peripheral Interface (SPI) bus, and Video Electronics Standards Association (VESA) local bus, among others. Although illustrated as a single bus in FIG. **1**, system bus **121** may be implemented as a combination of one or more suitable busses, and in some embodiments, various components may use one or more different busses to communicate with other components of portable information handling system **100**.

Memory subsystem **130** may comprise a system, device, or apparatus operable to retain and/or retrieve program instructions and/or data for a period of time (e.g., computer-readable media). Memory subsystem **130** may comprise random access memory (RAM), electrically erasable programmable read-only memory (EEPROM), a PCMCIA card, flash memory, magnetic storage, opto-magnetic storage, and/or a suitable selection and/or array of volatile or non-volatile memory that retains data after power to its associated information handling system, such as portable information handling system **100**, is powered down.

In portable information handling system **100**, I/O subsystem **140** may comprise a system, device, or apparatus generally operable to receive and/or transmit data to/from/within portable information handling system **100**. I/O subsystem **140** may represent, for example, a variety of communication interfaces, graphics interfaces, video interfaces, user input interfaces, and/or peripheral interfaces. For example, I/O subsystem **140** may comprise a touch panel and display adapter. The touch panel (not expressly illustrated) may include circuitry for enabling touch functionality in conjunction with a display (not expressly illustrated) that is driven by display adapter (not expressly illustrated).

Local storage resource **150** may comprise computer-readable media (e.g., hard disk drive, floppy disk drive, CD-ROM, and/or other type of rotating storage media, flash memory, EEPROM, and/or another type of solid state storage media) and may be generally operable to store instructions and/or data. For example, local storage resource **150** may store executable code in the form of program files that may be loaded into memory **130** for execution. In addition to local storage resources **150**, in some embodiments, portable information handling system **100** may communicatively couple via network **165** to a network storage resource (not expressly illustrated) using network interface **160**.

FIG. **2**A is a perspective view of a portable mouse in flat space-saving position. In the example embodiment, mouse **200** is comprised of a main plate **202** coupled to side plates **204** and **206**. In space-saving position, plates **202**, **204**, and **206** may lay flat such that mouse **200** has a reduced thickness. Mouse **200** may easily stow into a pocket or bag in the space-saving position, making transportation of the device easier.

FIG. **2**B is a perspective view of a portable mouse in curved active-usage position. In active-usage position, side plates **204** and **206** may slide apart from each other such that the overall width of mouse **200** increases. The sliding apart of side plates **204** and **206** may cause mouse **200** to curve. For example, mouse **200** may curve lengthwise to form curve **220**. Simultaneously, mouse **200** may curve widthwise to form curve **222**. The curving of mouse **200** in two directions may conform the shape of the device to a user's hand, thereby improving the usability and comfort of mouse **200**. The mechanical implementation details of mouse **200** are discussed in further detail below with the respect to FIGS. **3-4**.

In active-usage position, a user may move mouse **200** in different directions to interact with the graphical user interface of the portable information handling system. Mouse **200** may include one or more elements for detecting such movements. For example, mouse **200** may include a light source (not expressly illustrated), such as a light emitting diode and/or a laser, and one or more photodetectors (not expressly illustrated), such as a photodiode. Movement of

mouse **200** may be detected and measured based on the light emitted from the light source and the reflected light (e.g., light reflected off the surface on which mouse **200** is moved) detected by the photodetector. Mouse **200** may include a system or device (not expressly illustrated) to perform processing and/or calculations based on the light emitted and detected by mouse **200**.

In addition to movement, mouse **200** may detect other forms of input from a user. For example, mouse **200** may include scroll sensor **210**. Scroll sensor **210** may comprise a small rotating wheel, touch sensor, or another device that detects movement of a user's finger or other body part. Movement of a finger over scroll sensor **210** may enable a user to scroll and/or scan through content (e.g., documents, webpages, lists, etc.) on portable information handling system. In some embodiments, scroll sensor **210** may also function as a button such that additional input may be made by pressing scroll sensor **210** toward the body of the mouse. Although not expressly illustrated, mouse **200** may also include one or other buttons and/or sensors to enable input to the portable information handling system.

User input by movement of mouse **200**, activation of scroll sensor **210**, and/or other buttons and sensors of mouse **200** may be communicated to the information handling system. Mouse **200** may communicate with the information handling system in any suitable manner, including wired and wireless methods. For example, mouse **200** may use infrared radiation and/or radio signals to communicate information to/from the information handling system. In some embodiments, the information handling system may be equipped with a receiver to detect and process wireless signals from mouse **200**. In other embodiments, a receiver may be coupled to the portable information handling system (e.g., via I/O subsystem **140** discussed above with respect to FIG. **1**) to detect and process wireless signals from mouse **200**, and communicate those signals to the information handling system.

In order to perform the functions described above, mouse **200** may require power. Thus, mouse **200** may include a power source, such as a battery (not expressly illustrated). The battery may be a single-use battery (e.g., alkaline) or a rechargeable battery (e.g., nickel cadmium, nickel-metal hydride, etc.). Mouse **200** may charge its battery via a charging cable coupled to another power source, such as a power outlet, another electronic device, or a dedicated charging device.

The electronic elements (e.g., sensors, power source, communication means, motion detection means, etc.) of mouse **200** may be placed at any suitable location within mouse **200**. For example, one or more of the electronic elements may be stored in one or more electronics receptacles (not expressly illustrated). The electronics receptacle may be designed and located to minimize the thickness of mouse **200** in space-saving position. The electronics receptacle may couple to plates **202**, **204**, and/or **206** in a manner that does not interfere with movement and/or adjustment of plates when mouse **200** is moved between space-saving and active-usage positions. In some embodiments, an electronics receptacle may be placed near the front or rear end of mouse **200**. In other embodiments, one or more electronic elements may be coupled directly to plates **202**, **204**, and/or **206** in any suitable manner. Placement and/or bundling of electronic elements may be based on functionality, safety considerations, size constraints, or other considerations. The design, selection, and placement of electronic elements may be made to minimize interference with the operation of mouse **200** (e.g., to prevent interference with the movement of plates **202**, **204**, and **206**) and to minimize the dimensions of mouse **200** in space-saving position.

In some embodiments, one or more of plates **202**, **204**, and **206** may be covered in an elastic cover. The elastic cover may be comprised of a malleable material, such as an elastic thermoplastic, that compresses and/or stretches as mouse **200** is moved from space-saving position to active-usage position, and vice versa. In some embodiments, plates **202**, **204**, and **206** may be individually covered in an elastic cover. In other embodiments, plates **202**, **204**, and **206** may be covered in the same elastic cover.

FIG. **3** illustrates a blown-up view of the mechanical elements of a curving portable mouse. As discussed above with respect to FIG. **2**, mouse **200** may include main plate **202** and side plates **204** and **206**. Plates **202**, **204** and **206** may be comprised of a flexible material, including but not limited to steel, alloy steel, carbon fiber, polypropylene, and polyvinyl chloride (PVC). When force is applied, plates **202**, **204** and **206** may bend or change shape, and when the force is removed, the plates may revert back to flat position.

Main plate **202** may include a plurality of fins **302** formed by slits **304**. Slits **304** may extend from the lengthwise edge of main plate **202** toward the center of the plate. In some embodiments, slots **304** may be tapered such that each slit is wider at the edge of fins **302** (e.g., lengthwise edge of main plate **202**) than it is at the opposite end of fin **302** located near the center of main plate **202**. As discussed in more detail with respect to FIG. **4**B, tapering fins **302** may facilitate the widthwise bending (e.g., as illustrated by curve **222** in FIG. **2**) of mouse **200**. In certain embodiments, one or more punch holes **306** may be cut in main plate **202** where fins **302** begin. That is, the part of fin **302** located near the center of main plate **202** may include a punch hole **306** to prevent or limit the enlargement of slits **304** caused by material fatigue resulting from repeated use mouse **200** (e.g., from space-saving position to active-usage position, and vice versa).

Side plates **204** and **206** may include a plurality of slots **310**. Side plates **204** and **206** may couple to fins **302** of main plate **202** via one or more rivets **308**. Rivets **308** may be comprised of any suitable material, including steel, brass, copper, aluminum, and/or a combination thereof. Each rivet **308** may extend through a slot **310** of side plate **204** or **206** and a fin **302** of main plate **202**. Rivets **308** may couple the side plates to fins **302** of main plate **202**. Rivets **308** may be designed or configured such that rivets **308** travel within slots **310** so that slide plates **204** and **206** may move in relation to main plate **202** and in relation to each other.

As illustrated in FIG. **3**, slots **310** of side plates **204** and **206** may vary in length and angle. For example, slots **310** in the middle of side plates **204** and **206** may be longer than slots **310** located closer to either lengthwise end of the side plates. In addition, slots **310** in the middle of the side plates may be approximately perpendicular to the lengthwise edge of the side plates. However, slots **310** located further from the center slots may progressively angle inward toward the center perpendicular slots **310**. Slots **310** at either end of side plates **204** and **206** may angle the most toward the center perpendicular slot. The angling of slots **310** results in the ends of slots **310** being closer together on the edge of the side plates that face the center of mouse **200** (e.g., spacing **316** is less than spacing **314**). The angling of slots **310** may be used to control the curvature of mouse **200** in active-usage position. For example, increased angling of slots **310** may increase curvature of mouse **200** in active-usage position. As discussed below, the varying length and angle of slots **310** may cause mouse **200** to curve in two directions.

The number, size, and angle of slots **310** may be selected based on a functionality, lengthwise curve, widthwise curve, desired dimensions in active-usage mode, structural integrity of the materials, and/or other reasons.

As discussed above with respect to FIG. **2**, one or more of plates **202**, **204** and **206** may be covered in an elastic cover for user comfort, user safety, and to prevent objects and debris external to mouse **200** from interfering with the movement of the plates.

In one embodiment, the plates of mouse **200** are comprised spring steel; side plates **204** and **206** are approximately 140 millimeters (mm) long, 20 mm wide, and 0.2 mm thick; narrow spacing **316** for slots **310** is approximately 85 mm and wide spacing **314** is approximately 102 mm. However, the particular materials, dimensions, and components of mouse **200** may be selected based on cost, functionality, ergonomics, design, durability, and/or other factors. Although side plates **204** and **206** are shown above main plate **202** in FIG. **3**, the order of the plates may be rearranged in different embodiments.

FIG. **4**A illustrates a bottom view of the mechanical elements of a curving portable mouse in space-saving position. To reduce the space footprint of mouse **200**, side plates **204** and **206** are located closest to each other. Rivets **308** extend through slots **310** and fins **302** to couple side plates **204** and **206** to main plate **202**. In space-saving position, side plates **204** and **206** may overlap with main plate **202** such that slots **310** align with the spacing of the fins on the main plate. Thus, side plates **204** and **206** may overlap in a flat position with main plate **202** when mouse **200** is in space-saving position.

However, as the side plates **204** and **206** are pulled apart from each other, main plate **202** may begin to curve. FIG. **4**B illustrates a perspective view of the mechanical elements of a curving portable mouse in active-usage position. When side plate **204** or **206** is pulled away from main plate **202**, slots **310** will guide the movement of rivets **308** such that the rivets are forced closer together. As rivets **308** move closer together, fins **302** may begin to bunch or pinch together and create a widthwise (e.g., curve **222**) and a lengthwise curve (e.g., **220**) to mouse **200**. The increased length of slots **310** may allow side plates **204** and **206** to pull farther apart near the middle of mouse **200**, which may enhance the widthwise curve and the width of the mouse. Slits **304** between fins **302** may facilitate movement of fins **302** by preventing the overlap or interference of fin material as fins **302** are brought closer together.

When a user is done using mouse **200**, plates **204** and **206** may be pushed back towards each other to revert from active-usage position back to space-saving position. Again, slots **310** will guide the movement of rivets **308**, allowing fins **302** to separate and relax back to their flat position. In this manner, plates **204** and **206** may be moved back and forth to cause mouse **200** to switch between active-usage position and space-saving position.

Mouse **200** may be designed to stay stable in active-usage position. As explained above, a user may pull side plates **204** and **206** apart from each other to transition from flat space-saving position to curved active-usage position. The tension and friction created between the plates, slots **310**, and/or rivets **308** in active-usage position may prevent mouse **200** from reverting back to space-saving position until the user pushes side plates **204** and **206** back together. In addition, referring back to FIG. **3**, slots **310** may include a small narrowing **312** to help hold mouse **200** in active-usage position. When side plates **204** and **206** are pulled to active-usage position, rivets **308** are pulled past narrowing **312** and the narrowing may "lock" the rivets into place, thereby helping to retain mouse **200** in active-usage position. When sufficient pressure is applied to push side plates **204** and **206** back together, rivets **308** may pass narrowing **312**, allowing mouse **200** to revert back to flat space-saving position.

In some embodiments, mouse **200** may include an apparatus or device to assist with the transition to and from space-saving and active-usage positions. Mouse **200** may include a button or knob placed between side plates **204** and **206**. Sliding, pushing, or turning the button or knob may manually push side plates **204** and **206** apart. In some embodiments, mouse **200** may include an activation assistance element to facilitate the transition of mouse **200** between positions. For example, one or more springs may be positioned within mouse **200** to pull or push side plates **204** and **206** apart when activated. Other devices or apparatuses may be included in mouse **200** to help users transition between space-saving position and active-usage position.

FIG. **5** illustrates an example method **500** for coupling portions of a portable mouse. Method **500** may begin at step **502**, where the plates of the portable mouse are coupled together. As described above with respect to FIGS. **2-4**, a portable mouse may be comprised of a main plate and two side plates. Each side plate may be coupled to the main plate of the mouse such that the plates may be moved or slid in relation to each other. For example, one or more rivets may be placed through the slots of the side plates and affixed to the fins of the main plate.

In step **504**, method **500** adds a manner for moving the side plates in relation to the main plate. The side plates may be moved apart manually (e.g., by the user pulling the side plates apart or a button or knob that forces the side plates apart) or automatically (e.g., by a spring-assisted mechanism that forces the side plates apart). The slots of the side plates may serve as a guide for the rivets as the plates are moved. As explained above with respect to FIGS. **4**A and **4**B, sliding the slide plates apart may cause the mouse to transition from a flat space-saving position to a curved active-usage position. Such curving may be caused by the angling of the slots in the side plates that cause the rivets and fins of the main play to bunch or pinch together. In active-usage position, the portable mouse may have to curves (e.g., curves **220** and **222** illustrated in FIG. **2**).

In step **506**, method **500** adds a manner for holding the plates in position when the portable mouse is in active-usage mode. The side plates, rivets, slots, and fins may be designed such that when the mouse is in active-usage mode, the friction or tension between the various parts causes the side plates to stay in place. In some embodiments, the slots in the side plates may have a narrowing (e.g., narrowing **312** in FIG. **3**) that acts as a lock to hold the plates in place when the mouse is in active-usage mode. In some embodiments, the automatic mechanism of step **504** may help hold the side plates apart in active-usage mode.

In step **508**, method **500** places an elastic cover the plates of the portable mouse. Individual elastic covers may be placed over the plates of the mouse. In some embodiments, a single elastic cover may be place over all of the plates of the mouse. The elastic cover may protect plates, slots, fins, and rivets from direct contact by objects and debris external to the portable mouse. The elastic cover may also improve user comfort and/or safety. After step **508**, method **500** may end.

Method **500** may be implemented in any suitable manner. It is noted that certain steps or operations described in method **500** may be optional or may be rearranged in different embodiments.

Herein, "or" is inclusive and not exclusive, unless expressly indicated otherwise or indicated otherwise by context. Therefore, herein, "A or B" means "A, B, or both," unless expressly indicated otherwise or indicated otherwise by context. Moreover, "and" is both joint and several, unless expressly indicated otherwise or indicated otherwise by context. Therefore, herein, "A and B" means "A and B, jointly or severally," unless expressly indicated otherwise or indicated otherwise by context.

The scope of this disclosure encompasses all changes, substitutions, variations, alterations, and modifications to the example embodiments described or illustrated herein that a person having ordinary skill in the art would comprehend. The scope of this disclosure is not limited to the example embodiments described or illustrated herein. Moreover, although this disclosure describes and illustrates respective embodiments herein as including particular components, elements, features, functions, operations, or steps, any of these embodiments may include any combination or permutation of any of the components, elements, features, functions, operations, or steps described or illustrated anywhere herein that a person having ordinary skill in the art would comprehend. Furthermore, reference in the appended claims to an apparatus or system or a component of an apparatus or system being adapted to, arranged to, capable of, configured to, enabled to, operable to, or operative to perform a particular function encompasses that apparatus, system, component, whether or not it or that particular function is activated, turned on, or unlocked, as long as that apparatus, system, or component is so adapted, arranged, capable, configured, enabled, operable, or operative.

What is claimed is:

1. A portable mouse comprising:

a main plate including a first plurality of fins on a first lengthwise side of the main plate and a second plurality of fins on a second lengthwise side of the main plate;

a first side plate and a second side plate coupled to the main plate, the first side plate including a plurality of slots, the plurality of slots slidably coupled to the first plurality of fins,

wherein the main plate is configured to bend from a flat position to a curved position when the first and second side plates are pulled away from the main plate.

2. The portable mouse of claim **1**, wherein the first plurality of fins are coupled to the first side plate and the second plurality of fins are coupled to the second side plate.

3. The portable mouse of claim **2**, wherein the first and second plurality of fins are formed by slits in the main plate.

4. The portable mouse of claim **1**, wherein the plurality of slots are slidably coupled to the first plurality of fins via a plurality of rivets, wherein the plurality of slots are configured to guide the plurality of rivets when the first side plate is moved.

5. The portable mouse of claim **1**, wherein the plurality of slots are configured to overlap with the first plurality of fins when the fins are flat.

6. The portable mouse of claim **1**, wherein a center slot of the plurality of slots is approximately perpendicular to a lengthwise edge of the first side plate, wherein the plurality of slots are progressively angled from the center slot outward, the plurality of slots configured to pull the first plurality of fins closer together when the first side plate is pulled away from the main plate.

7. The portable mouse of claim **6**, wherein a lengthwise and a widthwise curve are formed when the first side plate is pulled away from the main plate.

8. The portable mouse of claim **1**, wherein the main plate, the first side plate, and the second side plate are covered in a common elastic cover.

9. The portable mouse of claim **1**, wherein the main plate, the first side plate, and the second side plate are covered in individual elastic covers.

10. A method of coupling portions of portable mouse comprising:

coupling a first side plate to a main plate, wherein the main plate includes a first plurality of fins on a first lengthwise side of the main plate on a second plurality of fins on a second lengthwise side of the main plate;

coupling a second side plate to the main plate, wherein the main plate is configured to bend from a flat position to a curved position when the first and second side plates are pulled away from the main plate,

wherein the first side plate includes a plurality of slots, the plurality of slots slidably coupled to the first plurality of fins.

11. The method of claim **10**, wherein the first plurality of fins are coupled to the first side plate and the second plurality of fins are coupled to the second side plate.

12. The method of claim **11**, wherein the first and second plurality of fins are formed by slits in the main plate.

13. The method of claim **10**, wherein the plurality of slots are slidably coupled to the first plurality of fins via a plurality of rivets, wherein the plurality of slots are configured to guide the plurality of rivets when the first side plate is moved.

14. The method of claim **10**, wherein the plurality of slots are configured to overlap with the first plurality of fins when the fins are flat.

15. The method of claim **10**, wherein a center slot of the plurality of slots is approximately perpendicular to a lengthwise edge of the first side plate, wherein the plurality of slots are progressively angled from the center slot outward, the plurality of slots configured to pull the first plurality of fins closer together when the first side plate is pulled away from the main plate.

16. The method of claim **15**, wherein a lengthwise and a widthwise curve are formed when the first side plate is pulled away from the main plate.

17. The method of claim **10**, wherein the main plate, the first side plate, and the second side plate are covered in a common elastic cover.

18. The method of claim **10**, wherein the main plate, the first side plate, and the second side plate are covered in individual elastic covers.

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